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## Malignant Duodenocolic Fistulae A Report of Three Cases

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Duodenocolic fistula is a rare condition, whether it may be resulted from a benign or malignant disease. Malignant fistulae are seen more frequently than benign ones, and the greater number of the former are due to carcinoma in the region of hepatic flexure of the colon. The first report of fistula formation between duodenum and the colon was credited to HALDANE in 1862<sup>5)</sup>. In this case malignant duodenocolic and cecocolic fistulae were present. In 1863 SANDERSON reported a case of benign duodenocolic fistula<sup>13)</sup>. Since then a number of cases have been reported. At the University of Chicago Clinics, only one case was found among 8,100 autopsies and 500,000 registered patients<sup>6)</sup>. In 1,400 cases of carcinoma of the right side of the colon, only two cases were observed<sup>1)</sup>. In another review carried out at the Massachusetts General Hospital between 1958 and 1970, only two cases were found<sup>16)</sup>.

The purpose of this paper is to report three cases of malignant duodenocolic fistula encountered at the Acoh City Hospital during the last five years and to review the clinical features and the treatment.

### Case Report

#### Patient 1.

A 58-year-old man was admitted to the Acoh City Hospital, complaining of loss of body weight and diarrhea on March 22, 1977. He complained of severe diarrhea after eating. It took place about two hours after meals. He denied vomiting, nausea, upper abdominal pain, fecal eructation and fever.

The patient looked chronically ill, and physical examination revealed a poorly defined mass in his right upper quadrant. Neither muscle guarding nor tenderness could be elicited.

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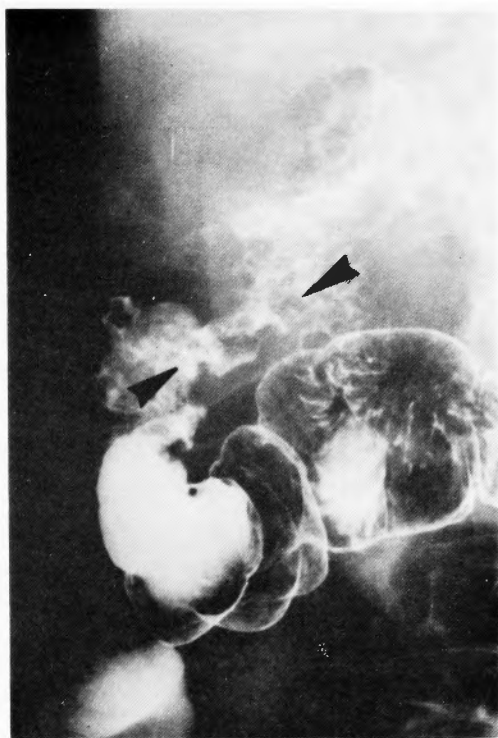
Key words: Carcinoma of colon, Duodenocolic fistula.

索引語: 結腸癌, 十二指腸結腸瘻.

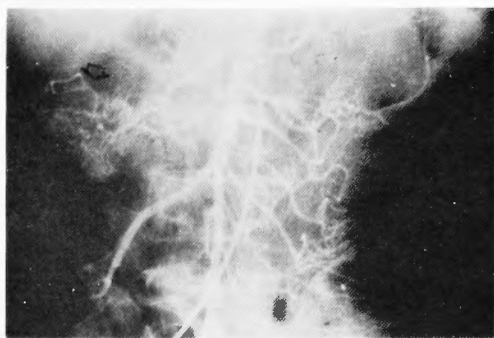
Present address: The 2nd Department of Surgery, Faculty of Medicine, Kyoto University. Sakyo-ku, Kyoto, 606, Japan.

The results of his laboratory studies were as follows; RBC,  $311 \times 10^4$ ; Hb, 9.6 g/dl; WBC 11,800; sodium, 141 mEq/L; potassium, 3.0 mEq/L; calcium, 4.6 mEq/L; CoR, 1: total protein, 6.2 g/dl; A/G, 0.81; total bilirubin, 0.9 mg/dl; direct bilirubin, 0.4 mg/dl; GOT, 14; ChoE, 0.51; LDH, 205.

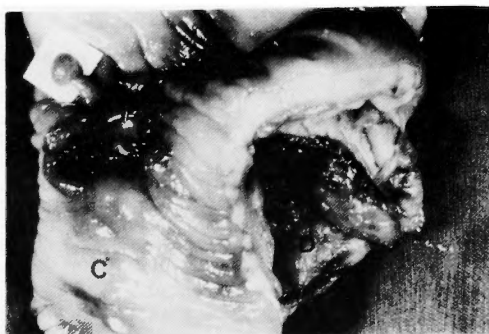
A barium meal revealed a fistula between the descending portion of duodenum and ascending colon (Fig. 1). A barium enema demonstrated the fistula as well. Superior mesenteric arteriography demonstrated kinkings, beaded arteries, A-V shunts and venous dilatation in the region of ascending colon (Fig. 2).



**Fig. 1.** Barium meal examination showing a duodenocolic fistula (arrow), between the descending portion of duodenum and ascending colon.



**Fig. 2.** Superior mesenteric arteriography demonstrating kinkings, beaded arteries, A-V shunts and venous dilatation in the region of ascending colon (arrow).



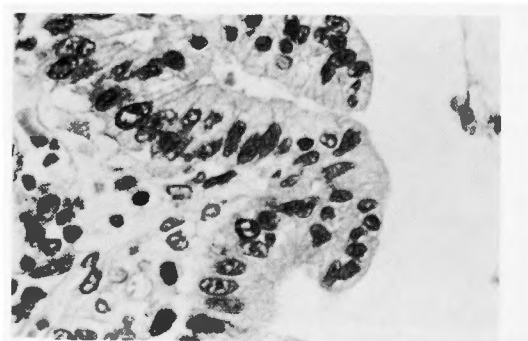
**Fig. 3.** Gross specimen showing wide fistula between ascending colon and second portion of duodenum. A benign polyp of colon was found near the fistulous opening. (C: colon, D: duodenum)

On April 20, 1977, his abdomen was explored through a paremedian skin incision. A fist-sized tumor arising from ascending colon with an attachment to the second portion of duodenum was found. Right hemicolectomy was performed to resect the tumor, the fistula and the adjacent portion of duodenal wall (Fig. 3). The duodenal defect was closed transversely in two layers. Ileotransverse colostomy was performed for intestinal reconstruction. Histological specimen showed adenocarcinoma of the colon (Fig. 4). A small amount of leakage from the duodenal wall was noticed on the 6th postoperative day, which eventually subsided within three weeks without surgical intervention, while the patient was treated by using intravenous hyperalimentation. The patient expired nine months later because of recurrence.

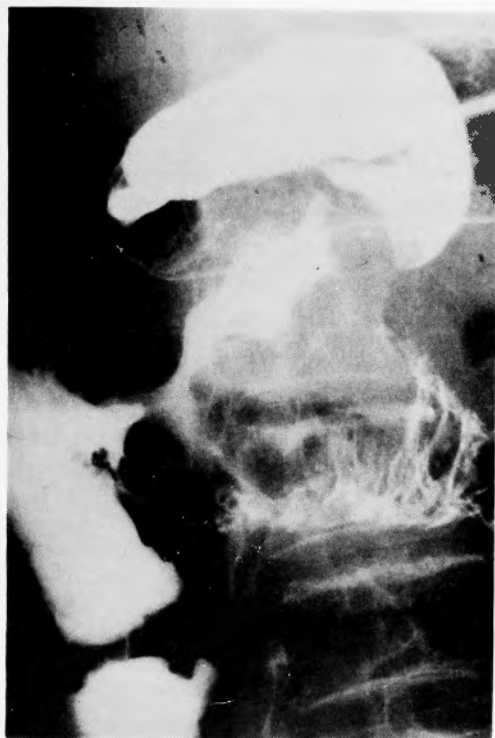
#### **Patient 2.**

A 73-year-old woman was admitted to the Akoh City Hospital on August 28, 1977 with a history of diarrheal bouts and loss of body weight over two months prior to the admission. Four days before the admission she noted severe burning sensation in her right upper quadrant. There was no feculent vomiting.

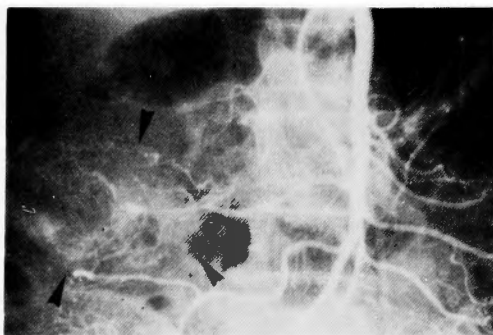
On physical examination there was no remarkable finding except abdominal tenderness in the right hypochondrial region. Stool test showed presence of blood, which was rated as one plus.



**Fig. 4.** Hematoxylin and eosin  $\times 400$ . Adenocarcinoma of colon



**Fig. 5.** Hypotonic duodenography showing a fistula, which runs laterally from the second portion of duodenum to the hepatic flexure of colon.



**Fig. 6.** Superior mesenteric arteriography, demonstrating irregularity, kinkings, staining, pooling and encasement of the vessels supplied by right colic artery.

The results of laboratory studies were as follows; RBC,  $354 \times 10^4$ ; Hb, 9.5 g/dl; WBC, 6,300; sodium, 154 mEq/L; potassium, 4.3 mEq/L; calcium, 4.6 mEq/L; total protein, 5.3 g/dl; A/G, 1.41; total bilirubin, 5.7 mg/dl; direct bilirubin, 4.3 mg/dl; GOT, 57; GPT, 43; ChoE, 0.53; LDH, 383; blood sugar, 84 mg/dl; BUN, 9 mg/dl.

Not only barium meal but also barium enema adequately revealed a fistula between the second portion of duodenum and the proximal transverse colon. Subsequent hypotonic duodenographic findings were also compatible with duodenocolic fistula (Fig. 5). Superior mesen-

teric arteriography demonstrated irregularity, kinkings, staining, pooling and encasement of the vessels supplied by right colic artery (Fig. 6).

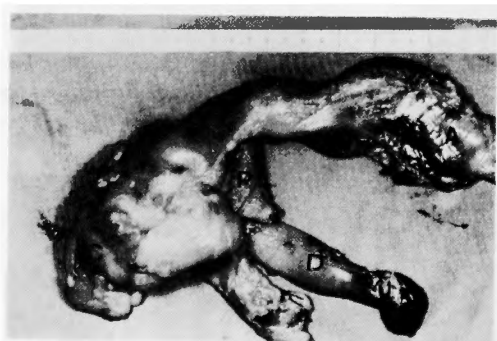
Intravenous hyperalimentation was administered for about three weeks to improve nutritional state and to correct dehydration.

The patient underwent operation on October 3, 1977. At surgery a fist-sized carcinomatous mass extending into the duodenum was found in the hepatic flexure. There was neither hepatic nor lymphatic metastases. We decided to carry out en bloc resection. Surgery included cholecystectomy, pancreatico-duodenectomy and right hemicolectomy (Fig. 7, 8). Reconstruction was performed following Child's method with ileotransversostomy. Histological specimen showed adenocarcinoma of the colon (Fig. 9).

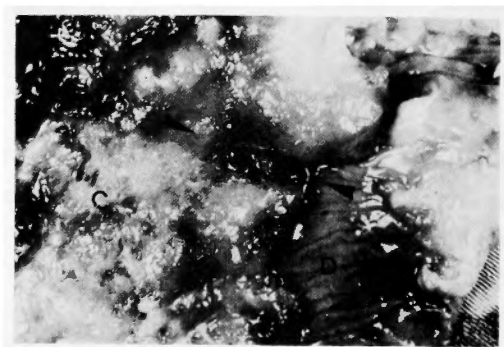
On the third postoperative day obstructive jaundice developed and PTCD was tried in vain. Then T-tube drainage was performed on the 4th postoperative day. But the patient died of acute cholangitis on October 10, 1977.

### Patient 3.

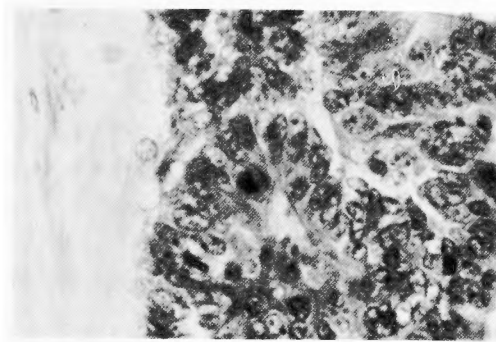
A 78-year-old woman was admitted to our hospital with complaints of nausea, vomiting, fatigue and right upper quadrant discomfort on February 13, 1979. Following admission she developed watery diarrhea 5-6 times a day.



**Fig. 7.** Gross specimen of en bloc resection containing gastric antrum, duodenum, the head of pancreas and right colon.  
(A: gastric antrum, P: pancreas, D: duodenum, C: colon)



**Fig. 8.** Gross appearance of the fistula between the duodenum and the hepatic flexure of the colon. (D: duodenum, C: colon)



**Fig. 9.** Hematoxylin and eosin.  $\times 400$ . Adenocarcinoma of the colon.



**Fig. 10.** Barium enema, showing a duodenocolic fistula between the hepatic flexure of colon and the second portion of duodenum. The fistula is between two arrows.

Physical examination revealed that she was chronically ill and cachectic. A poorly defined mass was felt in her right upper quadrant.

The laboratory data were as follows; RBC,  $322 \times 10^4$ ; Hb, 7.8 g/dl; WBC, 4,200; sodium, 140 mEq/L; potassium, 4.0 mEq/L; calcium, 3.6 mEq/L; CoR, 3; total protein, 4.7 g/dl; A/G, 0.75; total bilirubin, 0.2 mg/dl; direct bilirubin, 0.1 mg/dl; GOT, 19; GPT, 13; ChoE, 0.29; LDH, 476; BUN, 19 mg/dl.

A barium enema demonstrated a fistula between the second portion of duodenum and the

hepatic flexure of the transverse colon (Fig. 10). Intravenous hyperalimentation was performed for about three weeks to improve nutritional state.

On March 28, 1979, laparotomy performed by a paramedian skin incision. A large carcinoma arising from the hepatic flexure involving the second portion of duodenum, the right lobe of liver, pancreas and inferior caval vein was found. En bloc resection was abandoned. The tumor was bypassed by a side-to-side ileotransverse anastomosis. No specimen was available for histology.

The postoperative course was uneventful. The patient died seven months later.

## Discussion

### Diagnosis

In previous reviews of duodenocolic fistulae, it was said that barium enema was more available in disclosing the fistula than barium meal. Barium enema was successful in demonstrating the fistula in 85% to 100% cases, whereas barium meal disclosed the fistula in only 37.5% to 50%<sup>3,7,9,10,11,15</sup>. It was interpreted that the intraluminal pressure might be higher enough to overcome resistance in the rigid fistula, allowing the passage of barium into the small bowel<sup>9</sup>. In our cases both barium meal and barium enema were available in demonstrating the duodenocolic fistulae. In the examination by barium enema, supine, prone, and post-evacuation radiographs were recommended<sup>2,10</sup>. In attempt to gain a fine view, we used hypotonic duodenography. Further information was obtained with superior mesenteric arteriography.

### Signs and Symptoms

Signs and symptoms of these patients were caused mainly by the malignancy of the lesions with the superimposition of the fistulae. Diarrhea, loss of body weight, feculent vomiting, abdominal discomfort and gastrointestinal bleeding are common features (Table 1). Diarrhea has been attributed to the following causes by STEVEN J. MORRIS; (1) bile entering directly into the colon causing a colitis; (2) direct loss of gastric contents into the colon; (3) fecal material refluxing into the small bowel resulting in jejunitis; and (4) loss of the bile pool with resultant steatorrhea<sup>11</sup>. In the second case he developed diarrhea 2 hours after meals. In this case it was interpreted that diarrhea must have been caused by gastric contents or pancreatic juice entering into the colon. In other cases diarrhea must have been caused either by jejunitis or by colitis. Only the third case complained of feculent vomiting. In this case the colon was almost completely obstructed, and fecal material might have refluxed into the small intestine through the fistula. Feculent vomiting might depend on both the size of the orifice of the fistula and the degree of obstruction of the colon.

### Treatment

The poor nourishment, electrolyte imbalance, hypochromic and macrocytic anemia, and vitamin deficiencies are prevalent in these patients (Table 1), so these must be corrected before operation.

A variety of operative procedures for the treatment of the patients with malignant duodenocolic fistulae have been advocated. In the cases of far advanced malignant lesions the



**Table 1.** Summary of Clinical Features

Case No.	1.	2.	3.
Sex	Male	Female	Female
Age	58	73	78
Diarrhea	++	++	++
Weight loss	++	++	+
Feculent vomiting	—	—	+
Abdominal pain	—	++	+
Gastrointestinal bleeding	—	+	++
Anemia	Hypochromic Macrocytic	Hypochromic Macrocytic	Hypochromic
Electrolyte imbalance	++	++	++
Hypoproteinemia	++	++	++
Dehydration	+	+	++
Methods of diagnosis	Barium meal Barium enema Superior mesenteric arteriography	Barium meal Barium enema Superior mesenteric arteriography	Barium meal
location of the carcinoma	Hepatic flexure	Ascending colon	Hepatic flexure
Treatment	Right hemicolectomy in continuity with the fistula and a part of duodenal wall	Cholecystectomy Pancreatico- duodenectomy Right hemicolectomy Reconstruction following Child's method Ileotransversostomy	Ileotransversostomy
Survival time after operation	9 months	7 days	7 months

procedures such as colostomy or ileocolostomy have been recommended<sup>17)</sup>. In the third case ileotransversostomy was performed, which was followed by an uneventful recovery. The patient survived no less than seven months after the operation. In resectable cases some authors emphasized the advantages of the staged procedures<sup>12)</sup>. But we prefer one stage operation with the use of the intravenous hyperalimentation, because there is a chance of resection and a hope of cure<sup>4,7)</sup>. In potentially curable cases right hemicolectomy including the fistula and a part of the duodenal wall seems to be inadequate, since long time survival has not been obtained so far. We believe radical resection including cholecystectomy, pancreaticoduodenectomy and right hemicolectomy with reconstruction of Child's method and ileotransversostomy is a reasonable treatment for malignant duodenocolic fistulae<sup>14)</sup>.

### Summary

Three cases of malignant duodenocolic fistulae were reported to review the diagnosis and the treatment.

Both barium meal and barium enema were successful in demonstrating the fistulae. In

attempt to delineate fine structures, both hypotonic duodenography and superior mesenteric arteriography were very useful methods.

In resectable cases we believe one stage radical operation is a treatment of choice for malignant duodenocolic fistulae.

### Acknowledgement

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### References

- 1) Calmenson M, Black BM: Surgical management of carcinoma of the right portion of the colon with secondary involvement of the duodenum including duodenocolic fistula. *Surgery* **21**: 476-481, 1947.
- 2) Calvert DG, Medhurst GA: Fistula formation between the duodenum and colon. A report of three cases and a review of the condition. *Br J Surg* **48**: 136-139, 1960.
- 3) Chapuis PMB, et al: An unusual complication of duodenal diverticulum. *Dis Colon Rectum* **22**: 318-320, 1979.
- 4) Ergin MA, et al: Primary carcinoma of the duodenum producing a malignant duodenocolic fistula. *Dis Colon Rectum* **21**: 408-412, 1978.
- 5) Haldane DR: Case of cancer of the cecum, accompanied with cecoduodenal and cecocolic fistulae. *Edinburgh MJ* **7**: 624-629, 1862.
- 6) Helshenson LM, Kirsner JB: Duodenocolic fistula. *Gastroenterol* **19**: 864-872, 1951.
- 7) Lorenzo GA, et al: Gastrocolic fistula. *Am J Surg* **115**: 724-726, 1968.
- 8) Martinez LO, et al: Malignant fistulae of the gastrointestinal tract. *Am J Roentgenol* **131**: 215-218, 1978.
- 9) McQUAIDE JR, et al: Benign duodenocolic fistula. A report of 3 cases. *SA Mediese Tydskrif* 600-604 1979.
- 10) John PW, et al: Perforative carcinoma of colon and rectum. *Ann Surg* **180**: 734-740, 1974.
- 11) Morris SJ, et al: Cholecystoduodenocolic fistula secondary to carcinoma of the gallbladder. *Digest Dis* **23**: 849-852, 1979.
- 12) Raffensperger EC, et al: Duodenocolic fistula due to carcinoma of the hepatic flexure. *Arch Surg* **74**: 333-337, 1957.
- 13) Sanderson: Duodenocolic fistula. *Tr Path Soc London* **14**: 173-175, 1863.
- 14) Smith DG: Gastrocolic fistulas of malignant origin. *Surg Gyn and Obstet* **134**: 829-832, 1972.
- 15) Thoeny RH, et al: The roentgenologic diagnosis of gastrocolic and gastrojejunal fistulas. *Am J Roentgenol* **83**: 876-881, 1960.
- 16) Welch JP, et al: Perforative carcinoma of colon and rectum. *Ann Surg* **180**: 734-740, 1974.
- 17) Welch JP, et al: Malignant duodenocolic fistula. *Am J Surg* **133**: 658-661, 1977.

## 和文抄録

## 癌性十二指腸結腸瘻の3症例

赤穂市民病院外科

中元 光一，田中 明，新田 直樹，菊池 俊二，  
仁尾 義則，村沢 賢一，加藤 仁司，辺見公雄仁

結腸癌の十二指腸への浸潤により形成された十二指腸結腸瘻の3症例を経験した。58才の男性と73才および78才の女性であり，いずれも下痢，体重減少を主訴として来院した。腹痛，消化管出血は後者の2例に認められた。

診断は，胃十二指腸透視ならびに注腸透視にて，いずれの症例でも可能であったが，鮮明な像を得るには，低緊張性十二指腸造影が有効であった。

治療は，切除可能な症例で，一例に結腸右半切除と

瘻孔ならびに十二指腸部分切除術，他の一例に脾頭十二指腸切除術，結腸右半切除術，胆嚢別出術を施行し，切除不能例では，回腸横行結腸吻合術を施行した。術後生存期間は，それぞれ9ヶ月，7日，7ヶ月であった。術後長期生存を期待する為には，高カロリー輸液を併用し，一期的に脾頭十二指腸切除術，結腸右半切除術，胆嚢別出術を施行することが望ましいと思われる。